

## Advanced Technology Cloud Particle Probe for UAS, Phase II

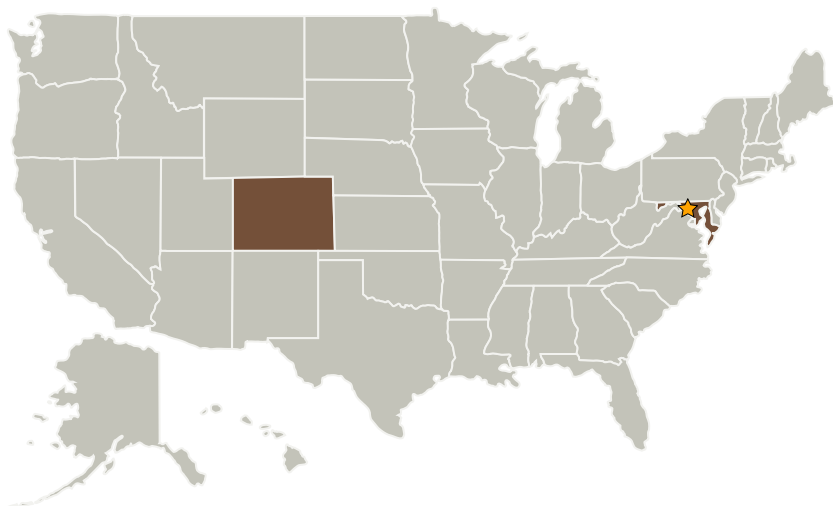
Completed Technology Project (2009 - 2012)



## Project Introduction

In Phase II SPEC will design, fabricate and flight test a state-of-the-art combined cloud particle probe called the Hawkeye. Hawkeye is the culmination of two decades of innovative instrument development at SPEC. The new probe will measure the size distribution of cloud and precipitation particles, provide high-resolution (2.3 micron pixel) images of cloud particles and remove artifacts from ice particle shattering. This will be accomplished by eclectic combination of technology developed in three existing SPEC optical cloud particle probes: 1) A fast FSSP, that measures size distributions from 1 to 50 microns and records individual particle statistics and remove shattered particles using inter-arrival times, 2) a cloud particle imager (CPI) with upgraded imagery capable of recording up to 500 frames per second, and 3) a 2D-S (Stereo) probe that is configured with one channel to provide full-view images of particles from 10 microns to 1.28 mm, and a second channel configured to provide full-view images of particles from 50 microns to 6.4 mm. Thus, using particle dimensions along the direction of flight will produce particle size distributions from 1 micron to several cm. Hawkeye will be designed for installation and autonomous (unattended) operation on NASA research aircraft, including the Global Hawk unmanned aerial system (UAS), and DC-8, WB-57F and ER-2 piloted research aircraft. Hawkeye will provide vastly improved measurements of particle and precipitation size distributions, particle shape, extinction coefficient, effective particle radius, ice water content and equivalent radar reflectivity. Hawkeye will be ready for installation on NASA aircraft for the upcoming ACE and GPM decadal missions, which are aimed at measurements of the effects of aerosols, clouds and precipitation on global climate change.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Goddard Space Flight Center (GSFC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
SPEC, Inc.	Supporting Organization	Industry	Boulder, Colorado

## Primary U.S. Work Locations

Colorado

Maryland

## Project Transitions

**December 2009:** Project Start**December 2012:** Closed out

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - └ TX08.3 In-Situ Instruments and Sensors
    - └ TX08.3.1 Field and Particle Detectors